



CAD Computer Aided Design	
Examples; 2D Design, Autodesk Inventor, Fusion 360, Photoshop, etc	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Easy to change designs • Designs are easily saved and sent • Can be worked on by multiple people simultaneously • Can be used for virtual testing • Can produce high-quality designs 	<ul style="list-style-type: none"> • Complex and time-consuming to learn <ul style="list-style-type: none"> • Expensive to buy • PCs can crash or be hacked – causing work to be lost • Takes up PC memory

CAM Computer Aided Manufacture	
Examples; 3D Printing, Laser Cutting, CNC Router, Automated Machines and Robotics, etc	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Faster and more accurate than traditional tools • Repetitive accuracy/ consistent outcomes <ul style="list-style-type: none"> • Machines can run 24/7 	<ul style="list-style-type: none"> • Expensive to buy the equipment, etc • Training takes cost and time • Need specialists to maintain and repair the machines • Dependence on CAM can cause unemployment

Flexible Manufacturing Systems
<p>This is where automated machines are adaptable and can produce different products if needed.</p> <p>If a manufacture is making a product with machines that are just dedicated to specific tasks they have to be reprogrammed and re-tooled before changing to a new task. This is time consuming and expensive.</p> <p>Examples include; CNC Machines, 3D Printers, Laser Cutters, Robotic arms, etc</p>

Just-in-Time (JIT) Manufacture	
<p>This is where manufacturers only order materials, parts, etc when needed. The customer's order triggers the production process and the resources needed for that order are the only ones bought.</p> <p>This can be used in any scale of production but is particularly useful for one-off production.</p>	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Saves on warehouse and storage costs • Money is not tied-up in stock <ul style="list-style-type: none"> • Little/minimal waste • Customer often pays in advance so money is secure before production 	<ul style="list-style-type: none"> • All production stops if a part/ material is missing • Needs to have a fast, reliable and good quality supply chain to work properly <ul style="list-style-type: none"> • Can be time-consuming

Lean Manufacturing
<p>This is where waste and energy is kept to a minimum. This helps manufacturers save money and resources in production, as well as helping minimise the environmental impact of producing products.</p>